



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**  
REGION I  
475 ALLENDALE ROAD  
KING OF PRUSSIA, PA 19406-1415

November 10, 2011

Mr. Kenneth Langdon  
Vice President Nine Mile Point  
Nine Mile Point Nuclear Station, LLC  
P.O. Box 63  
Lycoming, NY 13093

**SUBJECT: NINE MILE POINT NUCLEAR STATION - NRC INTEGRATED INSPECTION  
REPORT 05000220/2011004 AND 05000410/2011004**

Dear Mr. Langdon:

On September 30, 2011, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Nine Mile Point Nuclear Station Units 1 and 2. The enclosed inspection report documents the inspection results, which were discussed on October 17, 2011, with Mr. George Gellrich and other members of your staff.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

This report documents one self-revealing finding of very low safety significance (Green). The finding was determined not to involve a violation of NRC requirements. If you disagree with the cross-cutting aspect assigned to the finding in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region I, and the NRC Resident Inspector at Nine Mile Point Nuclear Station.

In accordance with 10 CFR Part 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the

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Sincerely,

A handwritten signature in black ink, appearing to read "Glenn T. Dentel". The signature is fluid and cursive, with the first name "Glenn" and last name "Dentel" clearly distinguishable.

Glenn T. Dentel, Chief  
Reactor Projects Branch 1  
Division of Reactor Projects

Docket Nos.: 50-220, 50-410  
License Nos.: DPR-63, NPF-69

Enclosure: Inspection Report 05000220/2011004 and 05000410/2011004  
w/Attachment: Supplementary Information

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Sincerely,

/RA/

Glenn T. Dentel, Chief  
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## U.S. NUCLEAR REGULATORY COMMISSION

## REGION I

Docket Nos.: 50-220, 50-410

License Nos.: DPR-63, NPF-69

Report No.: 05000220/2011004; 05000410/2011004

Licensee: Nine Mile Point Nuclear Station, LLC (NMPNS)

Facility: Nine Mile Point, Units 1 and 2

Location: Oswego, NY

Dates: July 1 through September 30, 2011

Inspectors: K. Kolaczyk, Senior Resident Inspector  
D. Dempsey, Resident Inspector  
J. Furia, Senior Health Physicist  
D. Kern, Senior Reactor Inspector  
W. Schmidt, Senior Reactor Analyst  
S. Shaffer, Senior Resident Inspector  
N. Perry, Senior Project Engineer  
J. Brand, Reactor Inspector  
J. Hawkins, Project Engineer  
J. Johnson, Resident Inspector  
J. Krafty, Resident Inspector  
R. Carrion, Senior Reactor Inspector  
D. Lawyer, Health Physicist

Approved By: Glenn T. Dentel, Chief  
Reactor Projects Branch 1  
Division of Reactor Projects

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## SUMMARY OF FINDINGS

IR 05000220/2011004, 05000410/2011004; 07/01/2011 - 09/30/2011; Nine Mile Point Nuclear Station, Units 1 and 2; Followup of Events and Notices of Enforcement Discretion.

This report covered a three-month period of inspection by resident inspectors and announced inspections performed by regional inspectors. The inspectors identified one finding of very low safety significance (Green). The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process (SDP)." The cross-cutting aspects for the findings were determined using IMC 0310, "Components Within Cross-Cutting Areas." Findings for which the SDP does not apply may be Green, or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4, dated December 2006.

### Cornerstone: Initiating Events

- Green. A Green self revealing finding was identified for inadequate implementation of corrective actions regarding vibration induced failures of socket welds. This finding resulted in an August 11, 2011, Nine Mile Unit 2 scram due to a failed socket weld on the vent line for the 'A' feedwater pump (FWP) minimum flow line. NMPNS did not properly consider the impact of high vibration levels on a vent line attached to the 'A' FWP mini-flow recirculation line. NMPNS corrective actions included upgrading the socket weld to the requirements outlined in industry operating experience (OE).

The inspectors determined that the finding was of very low safety significance (Green) through performance of a Phase 1 SDP in accordance with IMC 0609.04, Table 4a, "Characterization Worksheet for Initiating Events, Mitigating Systems (MS) and Barrier Integrity Cornerstones." Specifically, the finding did not contribute to both the likelihood of a reactor trip and the likelihood that mitigation equipment or functions will not be available. This finding has a cross-cutting aspect in the area of problem identification and resolution in that NMPNS did not implement and institutionalize OE through changes to station processes, procedures, equipment and training programs. Specifically in 1998 and again in 2010, NMPNS did not institutionalize external and internal OE to reduce the probability of a socket weld failure. (P.2.b per IMC 0310). (Section 4OA3)

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## REPORT DETAILS

### Summary of Plant Status

Unit 1 began the inspection period at 95 percent power due to troubleshooting an electro-hydraulic anomaly on the turbine control system. On July 1, power was returned to 100 percent. On August 2, plant power was briefly reduced to 98 percent to facilitate turbine control system testing. On September 29, reactor power was reduced to 95 percent to remove the 11 recirculation pump from service and conduct turbine stop valve testing. Power was returned to 100 percent later that day and Unit 1 remained at 100 percent power for the rest of the report period.

Unit 2 began the inspection period at 100 percent power. On July 17, power was reduced to 98 percent in response to a feedwater heater level transient. The condition was corrected and power was restored to 100 percent later that day. On August 6, the unit was shut down due to high reactor coolant leakage in the drywell. On August 10, the reactor was taken critical, but subsequently was scrammed from 15 percent power due to a ruptured small-bore vent line on the 'A' reactor feedwater pump (FWP) minimum flow line. Following repairs, the reactor was taken critical on August 12 and the plant was restored to 100 percent power on August 13. The unit remained at 100 percent power for the remainder of the inspection period.

## 1. REACTOR SAFETY

### **Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity**

#### 1R04 Equipment Alignment (71111.04)

#### .1 Partial Walkdown (71111.04Q – Two samples)

##### a. Inspection Scope

The inspectors performed partial walkdowns of the following systems:

- Unit 1 103 emergency diesel generator (EDG) and both 115 kilovolt off-site power lines while 102 EDG was inoperable for unplanned corrective maintenance
- The Unit 2 reactor building (RB) mat drainage sumps while portions of the systems were out of service due to mechanical failures

The inspectors selected these systems based on their risk-significance relative to the reactor safety cornerstones at the time they were inspected. The inspectors reviewed applicable operating procedures, system diagrams, the updated final safety analysis report (UFSAR), technical specifications (TSs), work orders (WOs), condition reports (CRs), and the impact of ongoing work activities on redundant trains of equipment in order to identify conditions that could have impacted system performance of their intended safety functions. The inspectors also performed field walkdowns of accessible portions of the systems to verify system components and support equipment were aligned correctly and were operable. The inspectors examined the material condition of

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the components and observed operating parameters of equipment to verify that there were no deficiencies. The inspectors also reviewed whether NMPNS staff had properly identified equipment issues and entered them into the corrective action program (CAP) for resolution with the appropriate significance characterization. Documents reviewed for each section of this inspection report are listed in the Attachment.

b. Findings

No findings were identified.

.2 Full Walkdown (71111.04S - Two samples)

a. Inspection Scope

The inspectors performed a complete system walkdown of accessible portions of the Unit 1 core spray and the Unit 2 reactor core isolation cooling (RCIC) systems to verify the existing equipment lineup was correct. The inspectors reviewed operating procedures, surveillance tests (STs), system health reports, drawings, equipment line-up check-off lists, and the UFSARs to verify that the systems were aligned to perform their required safety functions. The inspectors also reviewed electrical power availability, component lubrication and equipment cooling, hangar and support functionality, and operability of support systems. The inspectors performed field walkdowns of accessible portions of the systems to verify system components and support equipment were aligned correctly and were operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no deficiencies. Additionally, the inspectors reviewed a sample of related CRs and WOs to ensure that NMPNS appropriately evaluated and resolved any deficiencies.

b. Findings

No findings were identified.

1R05 Fire Protection (71111.05)

.1 Quarterly Inspection (71111.05Q - Seven samples)

a. Inspection Scope

The inspectors conducted tours of the areas listed below to assess the material condition and operational status of fire protection features. The inspectors verified that NMPNS controlled combustible materials and ignition sources in accordance with administrative procedures. The inspectors verified that fire protection and suppression equipment was available for use as specified in the area pre-fire plan, and passive fire barriers were maintained in good material condition. The inspectors also verified that station personnel implemented compensatory measures for out of service, degraded, or inoperable fire protection equipment, as applicable, in accordance with procedures.

- Unit 1 Northwest RB 198 and 218 foot elevations (fire zone RX198-1)
- Unit 1 Northeast RB 198 and 218 foot elevations (fire area RX198-2)
- Unit 1 Southwest RB 198 and 218 foot elevations (fire area RX198-3)
- Unit 1 Southeast RB 198 and 218 foot elevations (fire area RX198-4)
- Unit 2 Division I EDG room (fire area 28)
- Unit 2 Division II EDG room (fire area 29)
- Unit 2 Division III EDG room (fire area 30)

b. Findings

No findings were identified.

.2 Annual Inspection (71111.05A - One sample)

a. Inspection Scope

The inspectors observed a fire brigade drill scenario conducted on August 18, in the Unit 2 west normal switchgear building 261 foot elevation. The inspectors observed brigade performance during the drill to evaluate donning and use of protective equipment and self-contained breathing apparatus (SCBA), fire brigade leader command and control, fire brigade response time, communications, and the use of pre-fire plans. The inspectors attended the post-drill critique and reviewed the disposition of issues and deficiencies identified during the drill. The inspectors evaluated NMPNS's performance against the requirements contained in NMP-TR-1.01-107, "Nuclear Fire Brigade Training Program," Revision 01000. The inspectors evaluated specific attributes as follows:

- Proper wearing of turnout gear and SCBA
- Proper use and layout of fire hoses
- Employment of appropriate fire-fighting techniques
- Sufficient fire-fighting equipment brought to the scene
- Effectiveness of command and control
- Search for victims and propagation of the fire into other plant areas
- Smoke removal operations
- Utilization of pre-planned strategies
- Adherence to the pre-planned drill scenario
- Drill objectives met

The inspectors also evaluated the fire brigade's actions to determine whether these actions were in accordance with NMPNS's fire-fighting strategies.

b. Findings

No findings were identified.

1R06 Flood Protection Measures (71111.06)

.1 Internal Flooding Review (Two samples)

a. Inspection Scope

The inspectors reviewed the UFSAR, the site flooding analysis, and plant procedures to assess susceptibilities involving internal flooding. The inspectors also reviewed the CAP to determine if NMPNS identified and corrected flooding problems, and whether operator actions for coping with flooding were adequate. The inspectors reviewed the internal flood protection measures for equipment in the Unit 2 service water bays and Unit 2 Division I, II, and III essential switchgear rooms. The inspectors evaluated NMPNS's protection of safety-related systems from internal flooding conditions. The inspectors performed a walkdown of the areas, interviewed the system engineers, reviewed the internal flooding evaluation, and verified that equipment and conditions remained consistent with those indicated in the design basis and flooding evaluation documents.

b. Findings

No findings were identified.

.2 Annual Review of Cables Located in Underground Bunkers/Manholes

a. Inspection Scope (One sample)

The inspectors conducted an inspection of underground bunkers/manholes subject to flooding that contain cables whose failure could disable risk-significant equipment. The inspectors performed walkdowns of risk-significant areas, including the periodic inspection of man-holes MH-1 and MH-3, to verify the condition of risk significant underground electrical cables. Station personnel currently inspect MH-1 and MH-3 on a monthly basis due to known water leakage into the man-holes and no current automatic dewatering capability. Station personnel plan to continue monthly inspections until a design change to provide automatic dewatering is successfully installed and tested (planned for 2012). Inspections were performed in accordance with S-EPM-GEN-702, "Associated Transformer and Switchyard PMS," Revision 00500 and S-EPM-GEN-074, "Accessible Non-EQ Cables and Connections Inspection Procedure," Revision 00. The inspectors selected MH-1 and MH-3 based on the risk significance of equipment (high pressure core spray pump) powered by the cables which pass through these man-holes.

The inspectors interviewed engineers, reviewed documents, and entered the man-holes to verify cables and/or splices were intact, support structures provided appropriate support for the cables and cable trays, cables were not submerged in water, and to verify the as-built configuration matched associated design drawings. The inspectors also verified that degraded conditions (when applicable) were properly identified, documented, corrected, or entered into the CAP for resolution.

b. Findings

No findings were identified.

1R11 Licensed Operator Requalification Program (71111.11 – Two samples)

a. Inspection Scope

The inspectors observed licensed operator simulator training for Units 1 and 2 on August 30, which included a security threat and ground attack in the protected area of the plant. The inspectors evaluated operator performance during the simulated events and verified completion of risk significant operator actions, including the use of abnormal and emergency operating procedures (EOPs.) The inspectors assessed the clarity and effectiveness of communications, implementation of actions in response to alarms and degrading plant conditions, and the oversight and direction provided by the control room supervisors. The inspectors verified the accuracy and timeliness of the emergency classifications made by the shift managers and the TS action statements entered by the shift technical advisor. Additionally, the inspectors assessed the ability of the crew and training staff to identify and document crew performance problems.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12 - Four samples)

a. Inspection Scope

The inspectors reviewed the samples listed below to assess the effectiveness of maintenance activities on structure, system, and component (SSC) performance and reliability. The inspectors reviewed system health reports, CAP documents, maintenance WOs, and maintenance rule basis documents to ensure that NMPNS was identifying and properly evaluating performance problems within the scope of the maintenance rule. For each sample selected, the inspectors verified that the SSC was properly scoped into the maintenance rule in accordance with 10 CFR Part 50.65 and verified that the (a)(2) performance criteria established by NMPNS staff was reasonable. As applicable, for SSCs classified as (a)(1), the inspectors assessed the adequacy of goals and corrective actions to return these SSCs to (a)(2). Additionally, the inspectors ensured that NMPNS staff was identifying and addressing common cause failures that occurred within and across maintenance rule system boundaries.

- Unit 1 feedwater heater system
- Unit 2 control building chilled water system
- Unit 2 alternating current (AC) electric power
- Unit 2 direct current electric power and uninterruptible power supplies

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13 - Seven samples)a. Inspection Scope

The inspectors reviewed station evaluation and management of plant risk for the maintenance and emergent work activities listed below to verify that NMPNS performed the appropriate risk assessments prior to removing equipment for work. The inspectors selected these activities based on potential risk significance relative to the reactor safety cornerstones. As applicable for each activity, the inspectors verified that NMPNS personnel performed risk assessments as required by 10 CFR Part 50.65(a)(4) and that the assessments were accurate and complete. When NMPNS performed emergent work, the inspectors verified that operations personnel promptly assessed and managed plant risk. The inspectors reviewed the scope of maintenance work and discussed the results of the assessment with the station's probabilistic risk analyst to verify plant conditions were consistent with the risk assessment. The inspectors also reviewed the TS requirements and inspected portions of redundant safety systems, when applicable, to verify risk analysis assumptions were valid and applicable requirements were met.

Unit 1

- Emergent maintenance on temperature control valve TCV-79-07 on the 102 EDG cooling water system
- Week of July 18 that involved troubleshooting and testing of 15 reactor recirculation pump due to unexpected flow oscillations
- Week of August 8 which included planned surveillance testing of the 103 EDG, and emergent work on the RB ventilation system and 11 condensate water booster pump
- Week of August 29 which involved emergent work activities on the 11 control rod drive pump, the 102 EDG exhaust fan, and the city water supply line to Unit 1

Unit 2

- Emergent work to replace alternate sample pump for the stack gaseous effluent monitoring system, WO C91478961, on July 16
- Work activities associated with the plant startup on August 10
- Planned testing of the Division II EDG following the completion of maintenance activities

b. Findings

No findings were identified

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1R15 Operability Determinations and Functionality Assessments (71111.15 - Six samples)a. Inspection Scope

The inspectors reviewed operability determinations for the following degraded or non-conforming conditions:

- CR 2011-005317, and CR 2011-006410, concerning inadvertent Division II EDG 2EGS\*EG3, "Mechanical Failure Alarms," (computer point EGSPC02, lube oil pressure low alarm) received on June 30 and July 11, 2011, while the EDG was in standby
- CR 2011-004288 for the seat leakage of the Unit 1 core spray vent valves IV-40-31 and IV-40-33 (reactor coolant and primary containment isolation valves) on April 26, 2011
- CR 2011-007412, concerning leakage past Unit 2 residual heat removal check valve 2RHS\*39B and valve 2RHS\*40B identified on August 15, 2011.
- CR 2011-007437, concerning a small oil leak from a Unit 2 Division I EDG cylinder head
- CR 2011-006996, concerning low flow readings on the stack wide range gaseous monitor sample and system flow totalizers at Unit 2.
- CR 2011-007423, concerning increasing drywell floor drain leakage rate following a Unit 2 forced outage

The inspectors selected these issues based on the risk significance of the associated components and systems. The inspectors evaluated the technical adequacy of the operability determinations to assess whether TS operability was properly justified and the subject component or system remained available such that no unrecognized increase in risk occurred. The inspectors compared the operability and design criteria in the appropriate sections of the TSs and UFSAR to NMPNS evaluations to determine whether the components or systems were operable. Where compensatory measures were required to maintain operability, the inspectors determined whether the measures in place would function as intended and were properly controlled by NMPNS. The inspectors determined, where appropriate, compliance with bounding limitations associated with the evaluations.

b. Findings

No findings were identified.

1R18 Plant Modifications (71111.18 – Three samples)Temporary Modificationsa. Inspection Scope

The inspectors reviewed the temporary modifications listed below to determine whether the modifications affected the safety functions of systems that are important to safety. The inspectors reviewed 10 CFR 50.59 documentation and post-modification testing

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results, and conducted field walkdowns of the modifications to verify that the temporary modifications did not degrade the design bases, licensing bases, and performance capability of the affected systems.

- Engineering change package (ECP) ECP-11-000520, "Install Temporary Duct Blind Upstream of Fire Damper BV-210-25"
- ECP-11-000519, "Gag Division II, EDG Damper 2HVP\*MOD6B in The Closed Position"
- ECP- 11-000138, "Install Tygon Tubing in Bubbler to Restore Intake Differential Pressure Indication"

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19 - Eight samples)

a. Inspection Scope

The inspectors reviewed the post-maintenance tests (PMTs) for the maintenance activities listed below to verify that procedures and test activities ensured system operability and functional capability. The inspectors reviewed the test procedures to verify that the procedures adequately tested the safety functions that may have been affected by the maintenance activity, that the acceptance criteria in the procedures were consistent with the information in the applicable licensing basis and/or design basis documents, and that the procedures had been properly reviewed and approved. The inspectors also witnessed the tests or reviewed test data to verify that the test results adequately demonstrated restoration of the affected safety functions.

- Unit 1 WO C91499431 to repair flange leakage on 102 EDG temperature control valve TCV-79-07. The PMT was to verify no leakage from the flange while running the EDG in accordance with N1-ST-M4A, "Emergency Diesel Generator 102 and PB 102 Operability Test," Revision 00500
- Unit 1 WO C91525552 to replace the solenoid valve on RB supply isolation valve 202-15. The PMT was to verify acceptable stroke time using N1-ST-Q20, "RB Heating, Cooling, and Ventilation System Test," Revision 01300.
- Unit 1 WO C91532704 to replace PS-51-74, Reactor Feedwater Booster Pump 11 low header pressure switch. The PMT was to calibrate the switch in accordance with the WO
- Unit 1 WO C91439853 to test and replace capacitors in the main turbine electronic pressure regulator. The PMT was to perform electrical checks in accordance with steps in the WO
- Unit 1 WO C91532017 to replace a selector switch on average power range monitor channel 17. The PMT verified proper channel calibration and response using N2-ISP-092-326, "APRM #16 Instrument Channel Calibration/Test," Revision 01000, N1-ISP-092-327, "APRM #17 Instrument Channel Calibration/Test," Revision 0100, N1-ISP-092-346, "Local Power Range Monitoring (LPRM) Calibration Channel 16,"

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Revision 02, and N1-ISP-092-347, "Local Power Range Monitoring (LPRM) Calibration Channel 17," Revision 03

- Unit 2 WO C90703422 to perform cleaning, lubrication, and starter inspection of the RCIC Unit Cooler. The PMT was to run the cooler and take amperage readings of the motor using N2 EMP-GEN-V781, "Unit Cooler/Air Handling Unit P.M.," Revision 01501
- Unit 2 WO C91530786 to repack recirculation pump discharge isolation valve 2RCS\*MOV-18A. The PMT was to stroke the valve and check for leakage in accordance with S-MMP-GEN-201, "Site Valve Packing Procedure," Revision 00600.
- Unit 2 WO C91537255 to repair a broken socket weld on a small bore vent line off the 2FWR\*P1A feed pump recirculation line. The PMT verified no leakage at system operating pressure and temperature

b. Findings

No findings were identified.

1R20 Refueling and Other Outage Activities (71111.20 - One sample)

a. Inspection Scope

During the unplanned August 2011 outage at Unit 2, the inspectors observed and/or reviewed the following activities to verify that operability requirements were met and that risk, industry experience, and previous site-specific problems were considered.

- Following the August 6 plant shutdown due to excessive reactor coolant system leakage, the inspectors toured drywell elevations 261' and 249' to verify that components located in the general area of 2RCS\*MOV18A were not damaged by water and steam that emanated from the packing leak on that valve
- The inspectors attended several outage meetings where risk management activities were discussed. The inspectors also toured plant areas to verify risk management actions had been properly implemented
- The inspectors observed portions of the August 10, reactor plant startup and initial power ascension
- Following the August 11 scram, the inspectors toured the areas adjacent to the FWPs to ensure plant equipment was not damaged by water that leaked from the failed weld
- The inspectors observed NMPNS repair activities, and attended several outage meetings including a post scram plant operations review committee meeting.
- Following the completion of repairs to the feedwater system, the inspectors observed portions of startup activities on August 12. Items reviewed included initial criticality and reactor plant heat-up activities

b. Findings

No findings were identified.

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1R22 Surveillance Testing (71111.22 - Eleven samples)a. Inspection Scope

The inspectors observed performance of STs and/or reviewed test data for risk-significant SSCs to assess whether test results satisfied TSSs, the UFSAR, and NMPNS procedure requirements. The inspectors verified that test acceptance criteria were clear, tests demonstrated operational readiness and were consistent with design documentation, test instrumentation had current calibrations and the range and accuracy for the application, tests were performed as written, and applicable test prerequisites were satisfied. Upon test completion, the inspectors considered whether the test results supported that equipment was capable of performing the required safety functions. The inspectors reviewed the following STs:

- N2-PM-M1, "Monthly Test of RCIC Overspeed Device," Revision 00201
- N2-CSP-GEN-D100, "Reactor Water/Auxiliary Water Chemistry Surveillance," Revision 05
- N1-ISP-092-325, "APRM #15 Instrument Channel Calibration/Test," Revision 01000
- N2-ISP-LDS-Q006, "Main Steam Line Tunnel and Main Steam Line Lead Enclosure Instrument Channel Functional Test," Revision 00502
- N2-OSP-EGS-M@002, "Diesel Generator and Air Start Valve Operability Test-Division III," Revision 0800 (IST)
- N2-CSP-RMS-M301, "Noble Gas Sampling and Analysis," Revision 00300
- N2-ISP-MSS-Q@009, "Main Steam Line High Radiation Monitors Instrument Channel Functional Test," Revision 00100
- N2-OSP-EGS-M@001, "Diesel Generator and Diesel Air Start Valve Operability Test – Division I and II," Revision 00800 (IST)
- S-RPIP-3.0, "Radiological Surveys," Revision 01700
- N1-ST-C9, "Control Room Emergency Ventilation System Operability Test," Revision 01502
- N2-RTP-109, "Operation and Maintenance of the Digital Radiation Monitoring System (DRMS)" Revision 00201

b. Findings

No findings were identified.

## 2. RADIATION SAFETY

### Cornerstone: Occupational/Public Radiation Safety

#### 2RS1 Radiological Hazard Assessment and Exposure Controls (71124.01 – One sample)

##### a. Inspection Scope

###### Inspection Planning

The inspectors reviewed NMPNS's Performance Indicators (PIs) for the Occupational Exposure Cornerstone for follow-up. The inspectors reviewed the results of radiation protection program audits. The inspectors reviewed reports of operational occurrences related to occupational radiation safety since the last inspection.

###### Radiological Hazard Assessment

The inspectors verified that, since the last inspection, there have been no changes to plant operations that may result in a significant new radiological hazard for onsite workers or members of the public.

The inspectors reviewed the last two radiological surveys from selected plant areas. The inspectors verified that the thoroughness and frequency of the surveys were appropriate for the given radiological hazard.

The inspectors conducted walkdowns of the facility, including radioactive waste processing, storage, and handling areas to evaluate material conditions and potential radiological conditions.

###### Instructions to Workers

The inspectors selected containers holding nonexempt licensed radioactive materials that may cause unplanned or inadvertent exposure of workers, and verified that they were labeled and controlled.

The inspectors selected occurrences where a worker's electronic dosimeter (ED) noticeably malfunctioned or alarmed. The inspectors verified that workers responded appropriately to the off-normal condition. The inspectors verified that the issue was included in the CAP and dose evaluations were conducted as appropriate.

###### Contamination and Radioactive Material Control

The inspectors observed several locations where NMPNS monitors potentially contaminated material leaving the radiological controlled area, and inspected the methods used for control, survey, and release from these areas. The inspectors verified that the radiation monitoring instrumentation had appropriate sensitivity for the type(s) of radiation present.

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The inspectors reviewed NMPNS's criteria for the survey and release of potentially contaminated material. The inspectors verified that there was guidance on how to respond to an alarm that indicated the presence of licensed radioactive material.

The inspectors reviewed NMPNS's procedures and records to verify that the radiation detection instrumentation was used at its typical sensitivity level based on appropriate counting parameters.

The inspectors selected sealed sources from NMPNS's inventory records that present the greatest radiological risk. The inspectors verified that sources are accounted for and had been verified to be intact.

The inspectors verified that any transactions involving nationally tracked sources were reported in accordance with 10 CFR Part 20.2207. (also see Section 4OA5)

#### Radiological Hazards Control and Work Coverage

The inspectors examined NMPNS's physical and programmatic controls for highly activated or contaminated materials stored within spent fuel and other storage pools. The inspectors verified that appropriate controls were in place to preclude inadvertent removal of these materials from the pool.

The inspectors conducted selective inspection of posting and physical controls for high radiation areas (HRAs) and very high radiation areas (VHRAs), to the extent necessary to verify conformance with the Occupational PI.

#### Risk-Significant High Radiation Area and Very High Radiation Area Controls

The inspectors discussed with the radiation protection manager the controls and procedures for high-risk HRAs and VHRAs. The inspectors verified that any changes to NMPNS's procedures did not substantially reduce the effectiveness and level of worker protection.

The inspectors discussed with first-line health physics (HP) supervisors the controls in place for special areas that have the potential to become VHRAs during certain plant operations. The inspectors verified that NMPNS controls for all VHRAs, and areas with the potential to become a VHRA, ensured that an individual is not able to gain unauthorized access to the VHRA.

#### Radiation Protection Technician Proficiency

During job performance observations, the inspectors observed the performance of the radiation protection technician with respect to radiation protection work requirements. The inspectors verified that technicians were aware of the radiological conditions in their workplace and the radiation work permit (RWP) controls/limits, and that their performance was consistent with their training and qualifications with respect to the radiological hazards and work activities.

The inspectors reviewed radiological problem reports since the last inspection that found the cause of the event to be radiation protection technician error. The inspectors verified that there was no observable pattern traceable to a similar cause. The inspectors verified that this perspective matched the corrective action approach taken by NMPNS to resolve the reported problems.

#### Problem Identification and Resolution

The inspectors verified that problems associated with radiation monitoring and exposure control were being identified by NMPNS at an appropriate threshold and were properly addressed for resolution in NMPNS's CAP. In addition to the above, the inspectors verified the appropriateness of the corrective actions for a selected sample of problems documented by NMPNS that involve radiation monitoring and exposure controls. The inspectors determined that NMPNS was assessing the applicability of operating experience (OE) to their plants.

#### b. Findings

No findings were identified.

### 2RS2 Occupational ALARA Planning and Controls (71124.02 - One sample)

#### a. Inspection Scope

##### Inspection Planning

The inspectors reviewed pertinent information regarding plant collective exposure history, current exposure trends, and ongoing or planned activities in order to assess current performance and exposure challenges. The inspectors verified the plant's three-year rolling average collective exposure.

The inspectors verified the site-specific trends in collective exposures and source term measurements.

The inspectors reviewed site-specific procedures associated with maintaining occupational exposures as low as is reasonably achievable (ALARA,) which included a review of processes used to estimate and track exposures from specific work activities.

##### Source Term Reduction and Control

Using NMPNS records, the inspectors verified the historical trends and current status of significant tracked plant source terms known to contribute to elevated facility aggregate exposure. The inspectors verified that NMPNS was making allowances or developing contingency plans for expected changes in the source term as the result of changes in plant fuel performance issues or changes in plant primary chemistry.

### Problem Identification and Resolution

The inspectors verified that problems associated with ALARA planning and controls were being identified by NMPNS at an appropriate threshold and were properly addressed for resolution in NMPNS CAP.

#### b. Findings

No findings were identified.

### 2RS3 In-Plant Airborne Radioactivity Control and Mitigation (71124.03 - One sample)

#### a. Inspection Scope

The inspectors verified that respiratory protection devices used to limit the intake of radioactive materials are certified by the National Institute for Occupational Safety and Health/Mine Safety and Health Administration (NIOSH/MSHA) or had been approved by the NRC. The inspectors selected work activities where respiratory protection devices were used and verified that the devices were used consistent with their NIOSH/MSHA certification.

The inspectors reviewed records of air testing for supplied-air devices and SCBA bottles. The inspectors verified that air used in these devices meet or exceeded Grade D quality. The inspectors verified that plant breathing air supply systems met the minimum pressure and airflow requirements for the devices in use.

The inspectors selected individuals qualified to use respiratory protection devices, and verified that they had been deemed fit to use the devices by a physician.

The inspectors chose respiratory protection devices staged and ready for use in the plant or stocked for issuance for use. The inspectors observed the physical condition of the device components and reviewed records of routine inspection for each. The inspectors selected a sampling of the devices, and reviewed records of maintenance on the vital components. The inspectors verified that onsite personnel assigned to repair vital components had received vendor-provided training.

Based on UFSAR, TSs, and EOP requirements, the inspectors reviewed the status and surveillance records of SCBAs staged in-plant for use during emergencies. The inspectors observed NMPNS's capability for refilling and transporting SCBA air bottles to and from the control room and operations support center during emergency conditions.

The inspectors selected individuals on control room shift crews, and individuals from designated departments currently assigned emergency duties. The inspectors verified that control room operators and other emergency response and radiation protection personnel were trained and qualified in the use of SCBAs. The inspectors verified that personnel assigned to refill bottles were trained and qualified for that task.

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The inspectors verified that appropriate mask sizes and types were available for use. The inspectors selected on-shift operators, and verified that they had no facial hair that would interfere with the sealing of the mask to the face. The inspectors also verified that vision correction did not penetrate the face seal.

The inspectors reviewed the past two years of maintenance records for SCBA units used to support operator activities during accident conditions and designated as "ready for service." The inspectors verified that any maintenance or repairs on an SCBA unit's vital components were performed by an individual, or individuals, certified by the manufacturer of the device to perform the work. The inspectors reviewed the onsite maintenance procedures governing vital component work, and identified any inconsistencies with the SCBA manufacturer's recommended practices. For those SCBAs designated as "ready for service," the inspectors ensured that the required, periodic air cylinder hydrostatic testing was documented and up to date, and the retest air cylinder markings required by the U.S. Department of Transportation were in place.

The inspectors verified that problems associated with the control and mitigation of in-plant airborne radioactivity were being identified by NMPNS at an appropriate threshold and were properly addressed for resolution in NMPNS's CAP.

b. Findings

No findings were identified.

2RS4 Occupational Dose Assessment (71124.04 – One sample)

a. Inspection Scope

The inspectors reviewed the results of radiation protection program audits related to internal and external dosimetry.

The inspectors reviewed the dosimetry vendor's most recent results to determine the status of the contractor's accreditation.

The inspectors reviewed NMPNS procedures associated with dosimetry operations, including issuance/use of external dosimetry, assessment of internal dose, evaluation of and dose assessment for radiological incidents.

The inspectors verified that NMPNS had established procedural requirements for determining when external and internal dosimetry was required.

The inspectors verified that NMPNS's personnel dosimeters that require processing were NVLAP accredited. The inspectors verified the vendor's NVLAP accreditation. The inspectors ensured that the approved irradiation test categories for each type of personnel dosimeter used were consistent with the types and energies of the radiation present, and the way that the dosimeter was being used.

Enclosure

The inspectors evaluated the onsite storage of dosimeters before their issuance, during use, and before processing/reading, and the guidance provided to radiation workers with respect to care and storage of dosimeters.

The inspectors verified that NMPNS uses a "correction factor" to address the response of the ED as compared to thermoluminescent dosimeter/optically stimulated luminescence dosimeter for situations when the ED must be used to assign dose. The inspectors verified that the correction factor was based on sound technical principles.

The inspectors selected dosimetry occurrence reports or CAP documents for adverse trends related to EDs, such as interference from electromagnetic frequency, dropping or bumping, failure to hear alarms, etc. The inspectors verified that NMPNS had not identified any trends and implemented appropriate corrective actions.

The inspectors verified that NMPNS informed workers, as appropriate, of the risks of radiation exposure to the embryo/fetus, the regulatory aspects of declaring a pregnancy, and the specific process to be used for (voluntarily) declaring a pregnancy.

The inspectors selected individuals who had declared their pregnancy during the current assessment period, and verified that NMPNS's radiological monitoring program for declared pregnant workers was technically adequate to assess the dose to the embryo/fetus. The inspectors reviewed the exposure results and monitoring controls employed by NMPNS and with respect to the requirements of 10 CFR Part 20. The records of three workers were examined by the inspectors.

The inspectors reviewed NMPNS's methodology for monitoring external dose in situations in which non-uniform fields are expected or large dose gradients exist. The inspectors verified that NMPNS had established criteria for determining when alternate monitoring techniques were to be implemented.

The inspectors reviewed dose assessments performed using multibadging during the current assessment period. The inspectors verified that the assessment was performed consistently with NMPNS procedures and dosimetric standards.

The inspectors reviewed skin dose equivalent (SDE) assessments for adequacy. The inspectors evaluated NMPNS's method for calculating SDE from distributed skin contamination or discrete radioactive particles.

The inspectors evaluated NMPNS's neutron dosimetry program, including dosimeter types and/or survey instrumentation.

The inspectors selected neutron exposure situations and verified that (a) dosimetry and/or instrumentation was appropriate for the expected neutron spectra, (b) there was sufficient sensitivity for low dose and/or dose rate measurement, and (c) neutron dosimetry was properly calibrated. The inspectors verified that interference by gamma radiation had been accounted for in the calibration. The inspectors verified that time and motion evaluations were representative of actual neutron exposure events, as applicable.

For the special dosimetric situations reviewed in this section, the inspectors verified how NMPNS assigned dose of record for total effective dose equivalent (TEDE), SDE, and lens dose equivalent (LDE).

The inspectors verified that problems associated with occupational dose assessment were being identified by NMPNS at an appropriate threshold and were properly addressed for resolution in NMPNS's CAP. In addition, the inspectors verified the appropriateness of the corrective actions for a selected sample of problems documented by NMPNS involving occupational dose assessment.

b. Findings

No findings were identified.

2RS5 Radiation Monitoring Instrumentation (71124.05 - One sample)

a. Inspection Scope

The inspectors selected portable survey instruments in use or available for issuance. The inspectors checked calibration and source check stickers for currency, and assessed instrument material condition and operability.

The inspectors observed NMPNS staff performance as they demonstrated source checks for various types of portable survey instruments. The inspectors verified that high-range instruments were source checked on all appropriate scales.

The inspectors walked down area radiation monitors and continuous air monitors and verified that they were appropriately positioned relative to the radiation source(s) or area(s) they are intended to monitor.

The inspectors selected personnel contamination monitors and small article monitors and verified that the periodic source checks were performed in accordance with the manufacturer's recommendations and NMPNS procedures.

The inspectors selected one of each type of laboratory analytical instrument used for radiological analyses. The inspectors verified that daily performance checks and calibration data indicated that the frequency of the calibrations was adequate and there were no indications of degraded instrument performance.

As part of the problem identification and resolution review, the inspectors verified that appropriate corrective actions were implemented in response to indications of degraded instrument performance.

The inspectors selected one of the drywell/containment high-range monitors and reviewed the calibration documentation since the last inspection.

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The inspectors verified that an electronic calibration was completed for all range decades above 10 rem/hour and that at least one decade at or below 10 rem/hour was calibrated using an appropriate radiation source.

The inspectors verified that the calibration acceptance criteria were reasonable, accounting for the large measuring range and the intended purpose of the instruments.

The inspectors reviewed NMPNS capability to collect high-range, post-accident iodine effluent samples.

The inspectors observed electronic and radiation calibration of these instruments to verify conformity with NMPNS calibration and test protocols.

The inspectors reviewed calibration documentation for at least one of each type of instrument. For portable survey instruments and area radiation monitors, the inspectors reviewed detector measurement geometry and calibration methods, and had NMPNS demonstrate use of its instrument calibrator.

The inspectors selected portable survey instruments that did not meet acceptance criteria during calibration or source checks. The inspectors verified that NMPNS had taken appropriate corrective action for instruments found significantly out of calibration. The inspectors verified that NMPNS had evaluated the possible consequences of instrument use since the last successful calibration or source check.

The inspectors reviewed the current output values for NMPNS portable survey and area radiation monitor instrument calibrator units. The inspectors verified that NMPNS periodically measured calibrator output over the range of the instruments used through measurements by ion chamber/electrometer.

The inspectors verified that the measuring devices had been calibrated by a facility using National Institute of Standards and Technology traceable sources and that correction factors for these measuring devices were properly applied by NMPNS in its output verification.

The inspectors reviewed NMPNS's 10 CFR Part 61, "Licensing Requirements for Land Disposal of Radioactive Waste," source term to determine if the calibration sources used were representative of the types and energies of radiation encountered in the plant.

The inspectors verified that problems associated with radiation monitoring instrumentation were being identified by NMPNS at an appropriate threshold and were properly addressed for resolution in NMPNS's CAP.

b. Findings

No findings were identified.

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#### 4. OTHER ACTIVITIES

##### 4OA1 Performance Indicator Verification (71151)

##### .1 Mitigating Systems Performance Index (Ten samples)

###### a. Inspection Scope

The inspectors reviewed NMPNS's submittal of the MS Performance Index for the following systems for the period of July 1, 2010, to June 30, 2011.

- Units 1 and 2 emergency AC power system
- Units 1 and 2 high pressure injection system
- Units 1 and 2 heat removal system
- Units 1 and 2 residual heat removal system
- Units 1 and 2 cooling water systems

To determine the accuracy of the PI data reported during those periods, the inspectors used definitions and guidance contained in Nuclear Energy Institute (NEI) Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6. The inspectors also reviewed NMPNS operator narrative logs, CRs, MS performance index derivation reports, event reports, and NRC integrated inspection reports to validate the accuracy of the submittals.

###### b. Findings

No findings were identified.

##### .2 Occupational Radiation Safety (One sample)

###### a. Inspection Scope

The inspectors reviewed all NMPNS PIs for the Occupational Exposure Cornerstone for follow-up. The inspectors reviewed a listing of NMPNS action reports for issues related to the occupational radiation safety PI, which measures non-conformances with HRAs greater than 1 Roentgen/hour (R/hr) and unplanned personnel exposures greater than 100 millirem TEDE, 5 rem SDE, 1.5 rem LDE, or 100 mrem to the unborn child.

The inspectors verified if any of these PI events involved dose rates >25 R/hr at 30 centimeters or >500 R/hr at 1 meter. If so, the inspectors determined what barriers had failed and if there were any barriers left to prevent personnel access. For unintended exposures >100 mrem TEDE (or >5 rem SDE or >1.5 rem LDE), the inspectors verified if there were any overexposures or substantial potential for overexposure. The inspectors verified that no PI events had occurred during the assessment period.

###### b. Findings

No findings were identified.

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.3 Public Radiation Safety (One sample)

a. Inspection Scope

The inspectors reviewed a listing of NMPNS action reports for issues related to the public radiation safety PI, which measures radiological effluent release occurrences per site that exceed 1.5 mrem/quarter (qtr) whole body or 5 mrem/qtr organ dose for liquid effluents; or 5 millirads (mrads)/qtr gamma air dose, 10 mrads/qtr beta air dose; or 7.5 mrem/qtr organ doses from Iodine-131 (I-131), I-133, Hydrogen-3 (H-3) and particulates for gaseous effluents.

b. Findings

No findings were identified.

4OA2 Problem Identification and Resolution (71152 - Four samples)

.1 Routine Review of Problem Identification and Resolution Activities

a. Inspection Scope

As required by Inspection Procedure 71152, "Problem Identification and Resolution," the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to verify that NMPNS entered issues into the CAP at an appropriate threshold, gave adequate attention to timely corrective actions, and identified and addressed adverse trends. In order to assist with the identification of repetitive equipment failures and specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into the CAP.

b. Findings

No findings were identified.

.2 Annual Sample – Review of Changes to Planned Work Schedule as a Result of the Work Stoppage (One sample)

a. Inspection Scope

The inspectors reviewed the corrective maintenance and preventive maintenance items rescheduled as a result of the strike and the corrective maintenance backlog, to determine if they represented an increase in the chance of a plant transient or an increase in the unreliability of a mitigating system. Specifically, the inspectors reviewed the lists of:

- Rescheduled work for the weeks of July 11 through August 8, 2011, as documented in condition reports 2011-006369, 006533, 006590, 006692 and 006860, respectively

- Preventive maintenance items that had been deferred, because they would not have been completed within the 25% grace period
- Unscheduled critical corrective maintenance items for the week of August 1, 2011

b. Findings and Observations

No findings were identified.

The rescheduled items did not represent an increase in plant risk. The rescheduling of work activities and the control of the corrective maintenance backlog appeared to be conducted properly in accordance with CNG-MA-4.01-1000, "Integrated Work Planning," and the deferred preventive maintenance items were properly extended with adequate justification provided in accordance with CNG-AM-1.01-1018, "Preventive Maintenance Program."

.3 Annual Samples – Review of Units 1 and 2 Operator Workarounds (Two samples)

a. Inspection Scope

The inspectors reviewed the cumulative effects of the existing operator workarounds, operator burdens, existing operator aids and disabled alarms, and open main control room deficiencies to identify any effect on emergency operating procedure operator actions, and any impact on possible initiating events and mitigating systems. The inspectors evaluated whether station personnel had identified, assessed, and reviewed operator workarounds as specified in NMPNS procedure S-ODP-OPS-0124, "Control of Operator Workarounds and Burdens," Revision 0000.

The inspectors reviewed NMPNS process to identify, prioritize and resolve main control room distractions to minimize operator burdens. The inspectors reviewed the system used to track these operator workarounds and recent NMPNS self assessments of the program. The inspectors also toured the control room and discussed the current operator workarounds with the operators to ensure the items were being addressed on a schedule consistent with their relative safety significance.

b. Findings and Observations

No findings of significance were identified.

NMPNS tracks operator workarounds and burdens in the maintenance WO system. Workarounds are also tracked on the shift turnover/information sheet. The unit workaround coordinator performs a quarterly aggregate impact review to determine the combined impact of all workarounds and burdens on the ability of the on-shift personnel to perform their duties during normal plant operations and to respond to off-normal, emergency, and transient conditions. A long term work around that has existed since February 1988 that involved safety related Kaman radiation monitors in Unit 2 had not been evaluated as an operator burden. This issue required health physics personnel to implement daily compensatory actions to maintain operability of the monitors. NMPNS has not developed permanent corrective action(s) to correct the deficiency which is

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caused by a software error. The inspector reviewed the compensatory actions NMPNS had developed to address the software error and determined they were appropriate. The inspectors did not identify additional examples of degraded equipment that had not been evaluated as an operator workaround. The failure to evaluate the Kaman radiation monitor software error was documented by NMPNS in CR 2011-007960. The performance deficiency did not impact operability of the monitors, did not affect operators ability to respond in an event, and compensatory actions were appropriate. Therefore, this issue was considered minor.

.4 Annual Sample: Review of Effectiveness of Corrective Actions for Elevated Temperatures in the Unit 2 Emergency Diesel Generator Rooms and Associated Control Rooms (One sample)

a. Inspection Scope

This inspection was conducted to assess the effectiveness of Constellation's corrective actions implemented to address elevated temperatures within the NMPNS Unit 2 Division 1, 2, and 3 emergency diesel generator (EDG) and associated EDG control rooms during hot summer days. Specifically, NMPNS initiated CR-2006-3526 in August 2006 to address questions regarding the high outside ambient temperature effects on the EDG and associated control room high temperature limits. This issue was raised again by NMPNS on July 19, 2010, during elevated ambient temperatures (CR-2010-7409). In addition, NMPNS initiated CR-2010-8210 on August 12, 2010, after the NRC resident inspectors questioned the design limitations regarding the elevated temperatures within the EDG rooms. At the time, the Division 1 EDG room temperature was at 106 degrees Fahrenheit (°F) and the Division 2 EDG room temperature was at 110 °F.

The inspectors reviewed the associated CRs and related assessments to assess the effectiveness of the corrective actions. The inspectors reviewed the NMPNS Updated Final Safety Analysis Report (UFSAR), the EDG TSs, the Unit 2 EDG Vendor Specification NMP2-E031A, and the EDG Spare Parts Procurement Requirement Evaluation Form 01733 to determine the design requirements of the Unit 2 EDGs and associated components. The inspectors also interviewed engineers, plant operators, and management personnel, and performed several EDG system walkdowns during the month of July 2011. In addition, the inspectors reviewed surveillance test procedures to ensure that EDG testing was being performed in accordance with the current licensing basis.

b. Findings and Observations

No findings were identified.

The inspectors noted that the elevated temperature issue during the summer season within the Unit 2 EDG rooms and associated control rooms had existed since initial plant startup. In addition, the inspectors noted the original EDG design specification NMP2-E031A, Environmental Qualification Data Table, stated the average temperature for the EDGs control rooms was 85 °F (minimum of 65 °F and a maximum of 104 °F). From

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interviews conducted and documents reviewed, the inspectors determined that, during the hot summer days, temperatures in the Division 2 EDG room and associated control room could reach as high as 120 °F. The inspectors reviewed NMPNS calculations HVP-006 and HVP-008 and noted that while the EDGs were in standby (EDG not running), the maximum allowed room temperature for the EDG rooms and associated control rooms were 125 °F and 120 °F, respectively. The results of the calculations were based on the maximum outside ambient air temperature and existing ventilation fan capacity which would maintain the EDG room temperature equal to or less than 104 °F during EDG operation, the maximum EDG room temperature limit when the EDGs were running (Calculation HVP-006 and UFSAR Table 9.4-1). The inspectors verified that high room temperature alarms (annunciators 870315, 871315 and 871415) actuate at 110 °F to alert operators of EDG room high temperature conditions.

The inspectors noted that Constellation engineers determined operability of the EDGs and associated components was not impacted because the elevated temperatures within the EDG and control rooms were maintained within the maximum room temperature of 125 °F and 120 °F, respectively. In addition, engineering personnel determined that when the EDGs were in operation, the temperature in the EDG rooms was maintained to less than or equal to 104 °F by the safety-related EDG room cooling fans. The inspectors also reviewed the EDG jacket cooling water system to ensure it would not be impacted by the elevated temperatures.

The inspectors verified that there were no known failures of any of the EDGs or associated safety support systems or components due to the elevated room temperatures. However, the inspectors noted the NMPNS evaluation of this long standing condition did not consider the potential effects the elevated temperature may have on safety-related electrical and electronic equipment located inside the EDG control room cabinet (i.e., relays, switches, transistors, diodes, etc). Specifically, no evaluation had been performed to determine which components were most susceptible to the long term exposure of increased temperatures. As a result, no actions had been taken to address or correct the cause for the elevated temperatures or to establish an adjusted inspection or replacement activity for those components. NMPNS initiated CRs 2011-6906 and 2011-8173 to address these issues. 10 CFR 50, Appendix B, Criterion III, Design Control, requires parts and equipment be reviewed for suitability of application. The inspectors determined this performance deficiency was minor because as stated above operability of the NMPNS Unit 2 EDGs or their support systems and components (including electrical or electronic components) had not been impacted. The inspectors reviewed the scope of the new CRs and concluded the scope of corrective actions for these CRs was appropriate. These corrective actions included reviewing available historical data to establish a temperature profile for the areas of concern, taking new temperature readings to establish the difference between outside ambient temperature and temperature inside the EDG rooms and associated control rooms, reviewing the vendor specification and temperature limitations of the electrical or electronic components inside the associated control room cabinets, and adjusting inspection and or replacement of components if necessary based on the results obtained from the reviews.

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4OA3 Followup of Events and Notices of Enforcement Discretion (71153 – Five samples)

- .1 (Closed) Licensee Event Report (LER) 05000220/2011-001-00: Turbine Trip Due to Oil Pressure Fluctuations to the Turbine Master Trip Solenoid.

On May 2, 2011, Unit 1 experienced a turbine trip from 47 percent power. The main turbine master trip solenoid actuated due to oil pressure fluctuations, resulting in a pressure drop below the trip setpoint. NMPNS personnel determined the oil pressure fluctuations were caused by leaking fittings, binding of the secondary speed relay linkage, and main shaft oil pump discharge pressure fluctuations. NMPNS concluded that the root cause of the event was inadequate implementation of management job performance standards resulting in development and implementation of work performance documents which lacked sufficient detail associated with turbine maintenance activities. Corrective actions included repairing the turbine generator, and developing procedures for disassembly, inspection, reassembly and testing of the main turbine generator, exciter and control components.

This event was documented as a finding in Section 4OA3.1 of NRC Integrated Inspection Report 05000220/2011003 and 05000410/2011003. The LER was reviewed by the inspectors and no additional issues were identified. This LER is closed.

- .2 (Closed) Licensee Event Report (LER) 05000220/2011-002-00: Changes and Errors in the Methodology used by GE Hitachi to Demonstrate Compliance with 10 CFR 50.46 Acceptance Criteria.

In May 2011, NMPNS was informed by its fuel vendor of a change in its emergency core cooling system evaluation model that affected the calculation of peak cladding temperature and maximum local oxidation at Unit 1. The change addressed three individual errors and a model change. NMPNS personnel identified that one of the errors and the model change resulted in an increase in the calculated peak cladding temperature and maximum local oxidation above the acceptance criteria in 10 CFR Part 50.46. Nine Mile Point personnel revised the evaluation model to address the errors and model change, and the maximum average planar linear heat-generation rate (MAPLHGR) limits were adjusted through a plant monitoring system update to maintain the existing peak cladding temperature and maximum local oxidation. Additionally, NMPNS personnel verified that Unit 1 had not operated in an unanalyzed condition that significantly degraded plant safety by reviewing the maximum daily MAPLHGR values for the previous three years. This review confirmed that the MAPLHGR had not exceeded the revised limit.

The LER was reviewed by the inspectors and no findings of significance were identified. This failure to comply with 10 CFR Part 50.46 constitutes a violation of minor significance that is not subject to enforcement action in accordance with the NRC's Enforcement Policy. This LER is closed.

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.3 (Closed) LER 05000410/2011-001-01, As-Found Safety Relief Valve Lift Setpoints Exceed Technical Specification Allowable Values

On April 1, 2011, NMPNS determined that, based on the results of completed as-found testing, four out of 18 Main Steam Safety Relief Valves (SRVs) mechanically actuated at pressures that exceeded the allowable TS limit by more than the allowed plus or minus three percent. These 18 SRVs had been tested after being removed and replaced with pre-tested, certified SRVs during the 2010 Unit 2 refueling outage (RFO). NMPNS Unit 2 TS 3.4.4 requires the safety function of 16 SRVs to be operable in Modes 1, 2 and 3. Based on this requirement, NMPNS Unit 2 may have operated with more than the TS allowed inoperable SRVs during the operating cycle preceding the 2010 RFO. NMPNS determined the immediate cause for this condition to be inaccurate as-left lift pressure settings that resulted from the use of nitrogen as the test medium. NMPNS Unit 2 conducted onsite nitrogen testing of their SRVs from 1997 to 2008, and utilized an analysis for nitrogen-steam correlation that was insufficiently conservative.

As discussed in the LER, NMPNS's corrective actions included removal and refurbishment of the four SRVs that failed as-found set pressure testing. NMPNS is also utilizing an offsite test facility that uses saturated steam as the SRV test medium. Onsite nitrogen testing of NMPNS Unit 2 SRVs is no longer conducted. All 18 of the NMPNS Unit 2 SRVs were removed and replaced with pre-tested SRVs that had completed set pressure certification lifts using saturated steam. Additionally, Constellation concluded through analysis that the lift setpoint deviation of the valves would not have prevented the system from fulfilling its safety function. NMPNS Unit 2 determined that the four SRVs with out-of-tolerance lift pressures would have had minimal impact on the overpressure protection analysis. The LER was reviewed by the inspectors and no findings of significance were identified. This failure to comply with TSs constitutes a violation of minor significance that is not subject to enforcement action in accordance with the NRC's Enforcement Policy. This LER is closed.

.4 Notification of an Unusual Event Due to High Drywell Reactor Coolant System Leakage

a. Inspection Scope

On August 6, 2011, at 2:27 a.m., NMPNS Unit 2 commenced a rapid power reduction in response to an increasing trend in drywell floor drain leakage. Analysis of water in the floor drain sump confirmed the leakage to be from the reactor coolant system. At 3:17 a.m. the leakage rate exceeded 10 gallons per minute (GPM) and NMPNS declared an Unusual Event (UE) in accordance with emergency action level matrix item 2.1.1 shortly thereafter. At 3:45 a.m. NMPNS commenced a normal plant shutdown from 85 percent power. Reactor shutdown was accomplished at 9:41 a.m. when the operational mode switch was placed in shutdown and the UE was terminated at 11:27 a.m. The drywell leakage rate decreased as reactor coolant system pressure was lowered during the shutdown, and was below the TS limit of five GPM on August 7, 2011.

The inspectors responded to the control room and observed operators' responses to the event. Operators responded in accordance with the applicable normal, special, and EOPs and satisfied TS requirements regarding reactor coolant system leakage. NMPNS

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appropriately characterized the event in accordance with its emergency plan implementing procedures and notified the NRC, State, and local government authorities in a timely manner.

The inspectors reviewed the circumstances surrounding the event. The inspectors monitored startup preparation activities and corrective actions through attendance at outage update meetings, discussions with plant personnel, and review of records.

b. Findings

No findings were identified.

.5 Unit 2 Reactor Scram Due to Main Feedwater Line Break

a. Inspection Scope

On August 10, 2011, at 6:35 a.m., NMPNS Unit 2 commenced plant startup. At 9:12 a.m. the reactor was declared critical. On August 11, at 12:16 a.m., Unit 2 was manually scrammed from 15 percent power, prior to synchronizing the main generator to the electrical grid. Approximately two hours earlier, operators had noted a leak from the 'A' main FWP minimum flow line. Before action could be taken to stop the leak, a small bore vent line broke free increasing leakage from the nonsafety-related feedwater system. The water was collected in the turbine building sump. Operators manually scrammed the reactor and, following the scram, all control rods inserted and all systems functioned as designed.

The inspectors responded to the control room and verified that operators responded in accordance with the applicable procedures. The inspectors also evaluated repair activities and corrective actions prior to plant restart.

b. Findings

Introduction: A Green self revealing finding was identified for inadequate implementation of corrective actions regarding vibration induced failures of socket welds. This finding resulted in an August 11, 2011, Nine Mile Unit 2 scram due to a failed socket weld on a vent line for the 'A' FWP minimum flow recirculation piping. NMPNS did not properly consider the impact of high vibration levels on a vent line attached to the 'A' FWP minimum flow recirculation line.

Description: NMPNS Unit 2 has three motor-driven FWPs. Since the commencement of commercial power operation in 1987, the minimum flow line for the 'A' pump has exhibited high levels of vibration. In 1989, a socket weld for a ¾ inch vent line on the 'A' FWP minimum flow line that contained valves 2FWR\*V2A and 2FWR\*V3A failed. As a temporary measure, the vent line was removed and plugged. In 1990, the plug was removed and the vent line reinstalled. In May 2010, following installation of a modification to the 'A' FWP that was designed to increase pump flow during a planned power uprate, NMPNS personnel noted increased vibration levels on the pump minimum flow line. This issue was documented in CR 2010-006261, "High Vibration on 2FWR-

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FV2A Piping.” To minimize the effects of the increased vibration, NMPNS personnel established interim compensatory measures, regarding operation of the pump which limited flow through the line to 6600 GPM. On August 10, 2011, during a plant startup, NMPNS personnel who were monitoring the ‘A’ FWP noted the socket weld on the vent line which failed in 1989 had again begun to leak. Because of the excessive water leakage, NMPNS operations personnel inserted a manual reactor scram and isolated the minimum flow line.

An NMPNS examination of the failed weld concluded that the most likely cause for the failure was high cyclic fatigue. To minimize the possibility of a similar failure, NMPNS increased the size of the fillet socket welds on the vent pipe, and installed supports on the vent line, which attached the line to the minimum flow pipe.

The inspectors noted that industry studies in the mid to late 1990s conducted by the Electric Power Research Institute (EPRI) indicated that socket welds on small bore piping similar to what was installed on the ‘A’ FWP line were susceptible to failure. Industry guidance issued as a result of the studies recommended several corrective actions including conducting walkdowns and identifying high vibration areas, upgrading socket welds and installing supports. The NMPNS response to the industry guidance was documented in CR 1998-000073, “Small Bore Piping Connection Failures.” In the CR, NMPNS indicated that a review of susceptible piping would be conducted, and a monitoring program developed if needed. The inspectors noted NMPNS did not complete a review of socket welds as outlined in CR 1998-000073 or develop a socket weld monitoring program. Further, although increased vibration levels were identified on the minimum flow pipe for the ‘A’ FWP in May 2010 during Extended Power Uprate (EPU) related testing activities, NMPNS personnel did not verify the socket welds for the ¾ inch vent line on the ‘A’ FWP minimum flow line were acceptable even though they had a history of failure. In addition, analysis for the EPU did not identify vulnerabilities in the small bore piping.

The failure to complete the inspection actions and walkdowns outlined in CR 1998-000073, were documented in CR 2011-007767, “QPA Assessment, Actions Taken as a Result of CR 1998-000073 Should be Reevaluated.” This issue has a cross-cutting aspect in the area of area of problem identification and resolution in that NMPNS did not implement and institutionalize OE through changes to station processes, procedures, equipment, and training programs.

Analysis: The performance deficiency associated with this finding is that in 1998 and again following the completion of testing activities in 2010, NMPNS did not implement the recommended corrective actions stated in CR 1998-000073 to reduce the probability of socket weld failures in high vibration areas. As a result, a socket weld on a vent line for the ‘A’ FWP minimum flow line failed resulting in a reactor scram. This finding is more than minor, because it affected the procedure quality attribute of the Initiating Events Cornerstone objective of limiting the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically because NMPNS personnel did not adequately implement the recommended actions outlined in industry information, a socket weld on the ‘A’ FWP minimum flow line failed, which resulted in a reactor plant scram. This example is also

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similar to NRC Inspection Manual Chapter 0612, Appendix E, Examples of Minor Issues, Example 4.b where a procedure error resulted in a reactor plant trip.

The inspectors determined that the finding was of very low safety significance (Green) through performance of a Phase 1 SDP in accordance with IMC 0609.04, Table 4a, and "Characterization Worksheet for IE, MS and BI Cornerstones." Specifically, the finding did not contribute to both the likelihood of a reactor trip and the likelihood that mitigation equipment or functions will not be available. This finding has a cross-cutting aspect in the area of problem identification and resolution in that NMPNS did not implement and institutionalize OE through changes to station processes, procedures, equipment and training programs. Specifically in 1998 and again in 2010, NMPNS did not institutionalize external and internal OE to reduce the probability of a socket weld failure. (P.2.b per IMC 0310)

**Enforcement:** Enforcement action does not apply because this performance deficiency did not involve a violation of a regulatory requirement. Specifically the main FWP and associated piping are not safety related. As such the applicable maintenance and surveillance procedures are not governed by the requirements of NMPNS Unit TS 6.4 'Procedures.' This issue was entered into NMPNS CAP as CR-2011-007319. Because this finding does not involve a violation of regulatory requirements and has very low safety significance, it is identified as a finding. **(FIN 05000440/2011004-01, Inadequate Actions to Prevent Vibration Induced Failure on a Socket Weld for a Vent Line on the 'A' FWP Minimum Flow Line)**

#### 4OA5 Other Activities

##### .1 (Closed) NRC Temporary Instruction (TI) 2515/179, Verification of Licensee Response to NRC requirement for Inventories of Materials Tracked in the National Source Tracking System (NSTS) Pursuant to Title 10, Code of Federal Regulations, Part 20.2207 (10 CFR 20.2207)

###### a. Inspection Scope

The inspectors verified the information listed on NMPNS inventory record by performing a physical inventory, at the NMPNS facility and visually identifying each item listed on the NMPNS inventory.

During the physical inventory, the inspectors examined the physical condition of devices and/or containers containing nationally tracked sources; evaluated the effectiveness of NMPNS's procedures for secure storage and handling of nationally tracked sources; discussed NMPNS maintenance of devices containing nationally tracked sources, including leak tests, and verified that NMPNS is performing maintenance as required; and verified that the posting and labeling of nationally tracked sources was adequate.

The inspectors reviewed NMPNS records documenting transactions of subject sources, and compared these records with the data from NMPNS NSTS inventory. The inspectors evaluated the effectiveness of NMPNS procedures for updating inventory records.

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b. Findings

No findings were identified.

.2 Continued Implementation of Strike Plans During an Extended Strike (92711 – One sample)

a. Inspection Scope

On July 9, 2011, represented workers of IBEW Local 97 conducted a strike at NMPNS. The job action consisted of personnel not reporting to their assigned work locations and establishing a picket line at the Lake Road plant entrance. Although security guards are represented by Local 97, they did not participate in the strike since their contract had a no strike clause. During the 18 day strike, the inspectors monitored the acceptability of the NMPNS strike contingency plan by observing operators in the control room, conducting tours with non licensed personnel and observing the performance of surveillance and maintenance activities. HP controls provided during this period were also assessed. To ensure personnel who were performing work activities were properly trained and qualified, the inspectors reviewed the training and qualification records for personnel assigned to positions in the operations, chemistry and HP departments. A select number of procedure changes were reviewed to verify they had been made in accordance with site procedures. During the strike the inspectors verified that supplies were being delivered to the site when required. The inspectors also evaluated whether any evidence of fatigue among the replacement work staff existed. No licensed operator simulator training was observed since requalification training was suspended due to the strike.

b. Findings

No findings were identified

.3 Resumption of Normal Operations After a Strike (92712 - One sample)

a. Inspection Scope

On July 27, 2011, represented personnel of IBEW Local 97 voted to end their strike and return to work at NMPNS. Accordingly, personnel began to return to work on July 28 in accordance with a schedule that had been negotiated by NMPNS. The inspectors observed and monitored the reintegration process by attending reintegration informational meetings with returning employees where terms of the new employee contract were disseminated, attending management training sessions where post strike-related issues were discussed, and interviewing personnel in the field. The inspectors also performed extended control room observations.

b. Findings

No findings were identified

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.4 Independent Spent Fuel Storage Installation (ISFSI)

a. Inspection Scope – Inspection Procedure 60853

Constellation Energy selected the Transnuclear, Inc. Standardized NUHOMS® Horizontal Modular Storage System for dry storage of spent nuclear fuel at the NMPNS. The NRC had certified the system under Certificate of Compliance (CoC) No. 72-1004, Amendment No. 10, on August 24, 2009.

Constellation contracted with Transnuclear, Inc. (TN) to fabricate, as well as install, Horizontal Storage Modules (HSMs), Model 102, on the recently constructed ISFSI pad to store 40 Dry Shielded Canisters (DSCs), Model 61BT. Because this represented the first time that HSMs were fabricated on site rather than at a dedicated fabrication facility, the NRC inspected the on-site fabrication operations to verify that they were being carried out according to the CoC, UFSAR and applicable American Concrete Institute (ACI) codes and American Society for Testing Materials (ASTM) standards.

The HSM is a reinforced concrete unit with penetrations located at the top and bottom of the walls for air flow, and is designed to store DSCs with up to 24.0 kW of decay heat. The penetrations are protected from debris intrusions by wire mesh screens during storage operation. The DSC Support Structure, a structural steel frame with rails, is installed within the HSM.

The inspectors conducted a review of licensee and contractor fabrication and installation activities, including management and Quality Control (QC)/ Quality Assurance (QA) oversight, of the fabrication and installation of the nuclear horizontal modular system (NUHOMS) HSMs on the ISFSI pad to verify that the individuals performing quality-related activities were trained, qualified, and familiar with the specified design, designated fabrication and installation techniques and procedures, and QCs. The inspectors also reviewed approved fabrication and installation procedures, drawings, and purchase orders of the HSMs to determine if they were consistent with design commitments and requirements contained in the UFSAR. In addition, the inspectors reviewed licensee and vendor activities in preparation for a concrete placement for HSM base components and end wall components. The inspectors walked down the fabrication area; examined the rebar and embed installation; and verified that the rebar size, spacing, splice length, and concrete coverage on the top, side, and bottom complied to licensee-approved drawings, specifications, procedures, and other associated documents to assure that compliance to applicable codes, the CoC, and TSs was met. The inspectors also evaluated the concrete formwork installation for depth, straightness, and horizontal bracing and verified the overall dimensions and orientation for compliance to the licensee-approved drawings. The inspectors reviewed the National Ready Mixed Concrete Association Certificate of Conformance for the Oswego Plant of Northern Ready Mix, Inc., the batch plant which supplied the structural concrete for the fabrication of the concrete components, to verify that it and the trucks used to transport the concrete to the site met code requirements. The inspectors observed concrete delivery, placement, and vibration for two HSM bases and wall elements and observed tests for concrete slump and air content, temperature measurements, and the

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collection and preparation of cylinder samples for compression tests to verify that the work was implemented according to approved specifications and procedures. The inspectors reviewed records of previously placed concrete to assure that the compressive strength met the acceptance criteria.

The inspectors also reviewed CRs written by the licensee and contractor, and audits to determine if the findings were appropriately dispositioned and corrective actions implemented in a time frame commensurate with their safety significance, per the Quality Assurance Program (QAP).

The inspectors verified that the HSM components were being fabricated in accordance with the Safety Analysis Report (SAR), the QAP, the Safety Evaluation Report (SER), the CoC, and 10 CFR Part 72. The inspectors also verified that the licensee had reviewed ISFSI fabrication activities for adverse impact on site operations.

b. Findings

No findings were identified.

4OA6 Meetings, Including Exit

Exit Meeting

On October 17, 2011, the inspectors presented the inspection results to Mr. George Gellrich, Acting Site Vice President, and other members of the NMPNS staff. The inspectors verified no proprietary information was retained by the inspectors or documented in this report.

**ATTACHMENT: SUPPLEMENTARY INFORMATION**

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**SUPPLEMENTARY INFORMATION**

**KEY POINTS OF CONTACT**

**NMPNS Personnel**

G. Gellrich, Acting, Vice President  
M. Flaherty, Acting, Plant General Manager  
P. Bartolini, Supervisor, Design Engineering  
G. Connor, Design Engineering  
J. Dean, Supervisor, Quality Assurance  
R. Dean, Training Manager  
S. Dhar, Design Engineering  
J. Dosa, Director, Licensing  
D. Hanretty, Projects  
J. Holton, Supervisor, Systems Engineering  
G. Inch, Principle Engineer, EPU Project Manager  
J. Kaminski, Director, Emergency Preparedness  
J. Kidd, QPA  
M. Kunzwiler, Security Supervisor and Fatigue Rule Program Coordinator  
J. Leonard, Supervisor Design Engineering  
T. Lynch, Plant General Manager  
C. McClay, Senior Engineer  
M. Noffey, QPA  
D. O'Connor, QC Engineer  
F. Payne, Unit 1 General Supervisor Operations  
M. Philippon, Manager, Operations  
K. Phy, Project Management – ISFSI Project Manager  
J. Reid, Design Engineer  
M. Shanbhag, Licensing Engineer  
H. Strahley, Unit 2 General Supervisor Operations  
T. Syrell, Manager, Nuclear Safety and Security  
D. Vandeputte, Licensing  
J. Wellwood, ISFSI Project Management

## LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None.

Opened and Closed

05000410/2011004-01	FIN	Inadequate Actions to Prevent Vibration Induced Failure on a Socket Weld for a Vent Line on the 'A' FWP Minimum Flow Line
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Closed

05000220/2011-001-00	LER	Turbine Trip Due to Oil Pressure Fluctuations to the Turbine Master Trip Solenoid
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05000220/2011-002-00	LER	Changes and Errors in the Methodology used by GE Hitachi to Demonstrate Compliance with 10 CFR 50.46 Acceptance Criteria
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05000410/2011-001-01	LER	As-Found Safety Relief Valve Lift Setpoints Exceed Technical Specification Allowable Values
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05000220, 05000410/ 2515/179	TI	Verification of Licensee Response to NRC requirement for Inventories of Materials Tracked in the National Source Tracking System (NSTS) Pursuant to Title 10, Code of Federal Regulations, Part 20.2207 (10 CFR 20.2207)
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Discussed

None.

## LIST OF DOCUMENTS REVIEWED

### **Section 1R04: Equipment Alignment**

#### Procedures

N2-OP-35, "Reactor Core Isolation Cooling," Revision 01101  
N2-VLU-01, "Walkdown Order Valve Lineup and Valve Operations," Attachment 35, "N2-OP-35 Walkdown Valve Lineup," Revision 00  
N1-OP-45, "Emergency Diesel Generators," Revision 03200

#### Drawings

C-18007-C, "Reactor Core Spray P&I Diagram," Revision 58  
PID-35C, "Piping & Instrumentation Diagram Reactor Core Isolation Cooling," Revision 27  
PID-35A-15, "Piping & Instrumentation Diagram Reactor Core Isolation Cooling," Revision 15  
PID-35D-12, "Piping & Instrumentation Diagram Reactor Core Isolation Cooling," Revision 12  
PID-35B-13, "Piping & Instrumentation Diagram Reactor Core Isolation Cooling," Revision 13  
PID-66F-9, "Piping & Instrumentation Diagram Miscellaneous Drains," Revision 9

#### Condition Reports

2010-004014  
2011-008445  
2011-008446

#### Documents

UFSAR, Chapter 3.4.1.2 Permanent Dewatering System  
UFSAR, Chapter 9.3.3 Equipment and Floor Drain Systems

### **Section 1R05: Fire Protection**

#### Procedures

N1-FPI-PFP-0101, "Unit 1 Pre-fire Plans," Revision 01  
N2-FPI-PFP-0201, "Unit 2 Pre-fire Plans," Revision 02  
NMP-TR-1.01-107, "Nuclear Fire Brigade Training Program," Revision 01000.  
EPIP-EPP-28, "Firefighting," Revision 01600  
N2-PFP-NS261-02, West Normal Switchgear Building – 261  
EPIP-EPP-28, "Firefighting," Revision 1600  
NIP-FPP-01, "Fire Protection Program," Revision 01600  
GAP-INV-02, "Control of Material Storage Areas," Revision 02400

#### Documents

OS-FT-FIR-SCN-2-10 West Normal Switchgear Building Fire 261'  
Unit 1 UFSAR, Appendix 10A, "Fire Hazards Analysis"

#### Condition Reports

2011-007209

**Section 1R06: Flood Protection Measures**

Nine Mile Point Nuclear Station Individual Plant Examination (IPE), Revision 0

Procedures

CNG-AM-1.01-1029, Medium Voltage Cable Program, Revision 00000

S-EPM-GEN-064, Acquisition, Analysis, and Trending of MC2 Data, Revision 00400

S-EPM-GEN-700, Outdoor Transformer and Grounding Transformer Inspection PM, Revision 00601

S-MRM-REL-0102, Structural Monitoring Program, Revision 00700

Drawings:

EE-32F, Manhole & Ductline Sections and Details – Sheet 2

Miscellaneous

Constellation Energy Generation Group Response to NRC GL 2007-001 dated May 7, 2007

Kinetrics Letter, Diagnostic Testing of Kerite Cables NMP Nuclear Plant, dated March 29, 2011

NMP Units 1 and 2 Medium Voltage Electrical Cable Monitoring Program Cable Scope Data Base

NMP Unit 2 HPCS Cable Monthly As-Found Water Level (MH-1, MH-3) data base and associated maintenance work orders from January 2010 to June 2011

NRC IN 2002-12, Submerged Safety-Related Electrical Cables, dated March 21, 2002

NMP Units 1 and 2 OE 2010-003427, Assessment of NRC Information Notice 2010-26.

NMP Units 1 and 2 Medium Voltage Cables Program Health Report for April – June 2011

Service Task Authorization NMP-10-0026, Install Manholes MH-1 & MH-3 Sump Pumps and Level Detectors, Revision 0

Condition Reports

2011-006752

2011-006839

2011-007064

2011-006774

2011-006843

2011-007067

2011-007066

2011-006987

2011-007068

2011-006829

2011-007011

Action Items

2011-0005666-001

2011-0005565

Engineering Service Request

11-000413

Deviation Event Reports

DER-2-95-0311

DER-2-95-3157

DER-2-96-0310

Calculations

No. 12177/A10.1-AA-8

No. 12177/A.1-AA-18

No. ADCE-10-000269 A10.1-AA-008-02.00

Work Order

C90682406

C90682401

**Section 1R11: Licensed Operator Regualification Program**Procedures

N1-SOP-33A.1, "Loss of 115 KV," Revision 00200

N1-SOP-1, "Reactor Scram," Revision 02100

N1-EOP-1, "NMP1 EOP Support Procedure," Revision 00900

N1-EOP-2, "RPV Control Flowchart," Revision 01400

N1-OP-3, "Reactor Cleanup System," Revision 03102

N1-OP-45, "Emergency Diesel Generators," Revision 03200

N1-EOP-5, "Secondary Containment Control Flowchart," Revision 01400

N1-SOP-27.1, "External Security Threats," Revision 07

N2-SOP-101D, "Rapid Power Reduction," Revision 00702

N2-SOP-101C, "Reactor Scram," Revision 00500

N2-SOP-03, "Loss of AC Power," Revision 01200

N2-SOP-76, "External Security Threats," Revision 09

N2-EOP-RPV, "RPV Control – Flowchart," Revision 01300

N2-EOP-6, "NMP2 EOP Support Procedure," Revision 01200

EPIP-EPP-10, "Security Contingency Event," Revision 01801

EPIP-EPP-18, "Activation and Direction of the Emergency Plans," Revision 02000

**Section 1R12: Maintenance Effectiveness**AC Electric Power System Health Report, 2<sup>nd</sup> quarter 2010 and 2011Circuit Breakers Component Health Report, 2<sup>nd</sup> quarter 2011

OE33641

Current System Health Report

Condition Reports

2009-003950	2010-003090	2011-006781
2009-004053	2010-003093	2011-006782
2009-006684	2010-003567	2011-006783
2009-007423	2010-003658	2011-006784
2009-007738	2010-003915	2011-006785
2009-007825	2010-004406	2011-007355
2009-008459	2010-008892	2011-005520
2010-000705	2010-008986	2011-005198
2010-000792	2010-009744	2011-002794
2010-000951	2010-011137	2011-002946
2010-001310	2010-011194	2011-003256
2010-002346	2011-006780	2011-003326

**Section 1R13: Maintenance Risk Assessments and Emergent Work Control**

Procedures

CNG-OP-4.01-1000, "Integrated Risk Management," Revision 00800  
N2-CSP-RMS-@304, "Setup/Shutdown of Auxiliary Sampling Equipment," Revision 00400  
CNG-MN-1.01-1002, "Troubleshooting," Revision 00100

Documents

NMP2 DER 2-98-0073 Attachment 3, Internal Memo by S. K. Dhar Subject: DER 2-98-0073  
Action Item Closure  
Operations and Maintenance Reminder #424, "Small Bore Piping Failures," dated January 7,  
1998 (Proprietary)  
EPRI TR-104534 "Fatigue Management Handbook" (Proprietary)  
NDEP-PT-3.00 Liquid Penetrant Exam for 2FWR-V2B, V2C, V5A, V5B & V5C," dated  
August 11, 2011  
Doc No.: 2M00282, "Socoleet weld adjoining to 3/4" vent valve 2FWR-V2A Instl"  
Unit 1 Operating Logs  
Failure Modes and Effects Analysis for 15 RRP  
Core Operating Limits Report, Cycle 22

Work Orders

WO C91539552 Repairs to line 2-FWR-010-1-4 to support 2FWR\*V2A assembly

Condition Reports

1998-000073  
2009-003844  
2010-006253  
2010-006261  
2010-006262  
2010-011857  
2011-006600  
2011-006637  
2011-007319  
2011-007368  
2011-007767  
CA-2008-002169-002  
CA-2008-002169-003  
CA-2009-003497

**Section 1R15: Operability Determinations and Functionality Assessments**

Procedures

CNG-OP-1.01-1002, "Conduct of Operability Determinations / Functionality Assessments,"  
Revision 00101  
N1-ST-R25, "Core Spray high Point Vent IV Leakage Rate Test," Revision 00500

Condition Reports

2011-007133

**Section 1R18: Plant Modifications**

Documents

ECP- 11-000138, Install Tygon Tubing in Bubbler to Restore Intake Differential Pressure Indication

**Section 1R19: Post-Maintenance Testing**

Documents

NMP2 DER 2-98-0073, dated September 29, 1999

Operations and Maintenance Reminder #424, "Small Bore Piping Failures," dated January 7, 1998 (Proprietary)

EPRI TR-104534 "Fatigue Management Handbook" (Proprietary)

NDEP-PT-3.00 "Liquid Penetrant Exam for 2FWR-V2B, V2C, V5A, V5B & V5C," dated August 11, 2011

WR162094, "Weld from 2FWR-V2A to 2FWR-010-1-4"

TEMP MOD 89-056

Doc No.: 2M00282, "Sockolet weld adjoining to 3/4" vent valve 2FWR-V2A Instl"

Dwg PID-6A, "Piping & Instrumentation Diagram, Feedwater," revision 26

Condition Reports

1998-000073

2009-003844

2010-006253

2010-006261

2010-006262

2010-011857

2011-007213

2011-007319

2011-007368

CA-2008-002169-002

CA-2008-002169-003

CA-2009-003497

**Section 1R22: Surveillance Testing**

Procedures

S-RPIP-3.0, "Radiological Surveys," Revision 01700

N2-PM-M1, "Monthly Test of RCIC Overspeed Device," Revision 00201

N2-CSP-GEN-D100, "Reactor Water/Auxiliary Water Chemistry Surveillance," Revision 05

N1-ISP-092-325, "APRM #15 Instrument Channel Calibration/Test," Revision 01000

N2-ISP-LDS-Q006, "Main Steam Line Tunnel and Main Steam Line Lead Enclosure Instrument Channel Functional Test," Revision 00502

N2-OSP-EGS-M@002, "Diesel Generator and Air Start Valve Operability Test-Division III," Revision 0800

N2-CSP-RMS-M301, "Noble Gas Sampling and Analysis," Revision 00300  
N2-ISP-MSS-Q@009, "Main Steam Line High Radiation Monitors Instrument Channel Functional Test," Revision 00100  
N2-OSP-EGS-M@001, "Diesel Generator and Diesel Air Start Valve Operability Test – Division I and II," Revision 00800  
N2-OP-100A, "Standby Diesel Generators," Revision 01000  
N2-RTP-109, "Operation and Maintenance of the Digital Radiation Monitoring System (DRMS)," Revision 00201

Documents

Work Order C090634200, C0906324300  
UFSAR, Chapter 3.8 Electrical Power Systems

Condition Reports

CR-2011-006608

**Section 2RS3: In-Plant Airborne Radioactivity Control and Mitigation**

Training ID S202-CT1001C03 Revision 0, 2010 Respiratory Fair – 300 Level  
Radiation Protection Technician Job Performance Measures 200 Level  
DiVal Annual SCBA Cylinder Tests for Scott Air Pack 4.5 and NxG2  
DiVal Annual Visual/Functional Test Results for Scott NXG7 Air-Pak 4500 and Air-Pak 4.5

**Section 2RS4: Occupational Dose Assessment**

NVLAP Personnel Dosimetry Performance Testing for Landauer, Inc. March 22, 2010  
Procedure S-RPIP-5.1, Revision 00900, Dosimetry Use Placement and Dose Tracking

**Section 2RS5: Radiation Monitoring Instrumentation**

Quarterly High Level Well calibration Check Data Sheet  
Shepherd Irradiator Model 142 Calibration Data Sheet  
Model 1000B Gamma Calibrator – S/N 128 – Calibration Data Sheet  
Shephard Model 28 and 89 range Calibration Data Sheet

**Section 4OA1: Performance Indicator Verification**

CR-2010-001331	CR-2010-008752	CR-2010-011081
CR-2010-007093	CR-2010-008756	CR-2010-011139
CR-2010-007494	CR-2010-009381	CR-2010-011261
CR-2010-007751	CR-2010-010094	CR-2010-012053
CR-2010-007900	CR-2010-010769	CR-2010-012121
CR-2010-007907	CR-2010-010795	CR-2010-012322
CR-2010-007941	CR-2010-010810	CR-2010-012367
CR-2010-008067	CR-2010-010845	CR-2011-000026
CR-2010-008115	CR-2010-010875	CR-2011-000065
CR-2010-008412	CR-2010-011077	CR-2011-000421

Attachment

CR-2011-000981	CR-2011-002548	CR-2011-004308
CR-2011-001258	CR-2011-002614	CR-2011-004313
CR-2011-001296	CR-2011-003008	CR-2011-004229
CR-2011-001387	CR-2011-003124	CR-2011-004254
CR-2011-001615	CR-2011-003339	CR-2011-005008
CR-2011-002039	CR-2011-003674	CR-2011-005300
CR-2011-002266	CR-2011-003914	CR-2011-005457

## **Section 40A2: Problem Identification and Resolution**

### Condition Reports

CR-2006-03526	CR-2011-00517	CR-2011-06906
CR-2010-04458	CR-2011-05317	CR-2011-08173
CR-2010-06177	CR-2011-06410	
CR-2010-07409	CR-2011-06463	
CR-2010-08210	CR-2011-06464	
CR-2010-03526	CR-2011-06798	
CR-2011-00225	CR-2011-06798	

### Procedures

S-ODP-OPS-0124, "Control of Operator Workarounds and Burdens," Revision 0000  
 N2-OSP-EGS-M@002, Diesel Generator And Diesel Air Start Valve Operability Test-Division III, completed 7/27/11  
 N2-ARP-01, 2CEC\*PNL871, Series 400 Alarm Response Procedures, Revision 0  
 N2-ARP-02, 2CES\*IPNL413, Alarm Response Procedures, Revision 0  
 N2-ARP-870300, 2CEC\*PNL870 Series 300 Alarm Response Procedures, Revision 0  
 N2-ARP-871300, 2CEC\*PNL871 Series 300 Alarm Response Procedures, Revision 0  
 N2-OP-57, Diesel Generator Building Ventilation System, Revision 5  
 N2-PM-S014, Building Rounds, Revision 5

### Drawings

12177-TL 2HVP-014, Stdby Dsl Gen 2EGS\*EG3 RM Temp Alarm 2HVP\*TT10B, Sheets 1 & 2, Revision 14

### Miscellaneous

UFSAR Section 8.3, Onsite Power System  
 01733, Procurement Requirement Evaluation Form, Revision 70  
 CR 2010-4458, Attachment 2, Apparent Cause Evaluation EDG Air Compressor Failure Design Basis Document, Emergency Diesel Generator And Auxiliary Systems, Revision 22  
 Spec. No. NMP2-E031A, Standby Diesel Generator Systems  
 1L2HVP-014, Stdby Dsl Gen 2EGS\*G3 RM Temp Alarm 2HVP\*TT-10B, Revision 3  
 E&DCR-P41225, Change In EDG Room Ambient Temperature  
 TS Sections 3.8.1, 3.8.2, 3.8.3, Limiting Condition of Operations  
 SR 3.8.1.2, SR 3.8.1.3, SR 3.8.1.4, SR 3.8.1.5, SR 3.8.1.6, SR 3.8.1.13, Surveillance Requirements

Work Orders

C090320800, 2EGS\*EG2, Annunciator 114 On Panel 2CES\*PNL413 Is in Solid With No Actual High Stator Temp.

C90963449, Stdby Dsl Gen 2EGS\*EG3 Rm Temp Alarm Calibration Of 2HVP\*TE10B Loop

**Section 40A3: Followup of Events and Notices of Enforcement Discretion**

EPIP-EPP-02, "Classification of Emergency Conditions at Unit 2," Revision 01801

N2-SOP-101D, "Rapid Power Reduction," Revision 00702

N2-SOP-101C, "Reactor Scram," Revision 00500

N2-OP-101D, "Power Changes," Revision 01100

N2-EOP-RPV, "RPV Control Flowchart," Revision 01300

**Section 40A5: Other Activities**

Specifications for HSMs, including material specifications for concrete, aggregate, heat shields, rails inside of the HSMs, and rebar

Transnuclear, Inc. Specification NUH-03-0215, Steel Fabrication for NUHOMS HSM, Revision 2

Transnuclear, Inc. Specification NUH-03-0217, Field Erection if NUHOMS HSM Array, Revision 1

Transnuclear, Inc. Specification NUH-03-0314, Concrete Construction of NUHOMS HSM, Revision 0

Engineering Specification # NMPCO Spec 16461002, Revision 001, approved April 7, 2011

Procurement documents for fabrication of HSMs on site

Purchase Order 7711921, ISFSI Project NUHOMS HSM Model 102, Shield End Walls, and Back Panels, Revisions 1 through 4

Procedures used to fabricate components of HSMs

Project-specific Transnuclear Implementing Procedure (PTIP) 11203-2.1, Roles and Responsibilities – Onsite Fabrication and Installation of HSM – 102s, Revision 2

PTIP 11203-2.2, Training Requirements for Personnel Assigned to the NMP HSM Project, Revision 0

PTIP 11203-4.1, Procurement Controls of NAES Quality Procurement Documents, Revision 0

PTIP 11203-5.1, Concrete Mix Designs and Trial Batch Testing, Revision 0

PTIP 11203-5.3, Concrete Batching and Testing Procedure for Onsite Fabrication of HSM Model 102 at NMP, Revision 3

PTIP 11203-5.4, HSM Model 102 Wall – Concrete Construction, Revision 3

PTIP 11203-5.5, HSM Model 102 Base – Concrete Construction, Revision 3

PTIP 11203-5.6, HSM Model 102 Roof – Concrete Construction Procedure, Revision 1

PTIP 11203-5.7, HSM Model 102 Door – Concrete Construction Procedure, Revision 1

PTIP 11203-5.8A, Field Erection of HSM Model 102 Double Array, Revision 0

PTIP 11203-5.8B, Field Erection of HSM Model 102 Single Array, Revision 1

PTIP 11203-5.9, Rigging Control Procedure for HSM Model 102, Revision 3

PTIP 11203-5.12, General Construction Requirements and Methods for Onsite Fabrication of NUH-HSM-Model 102, Revision 0

PTIP 11203-7.7, Review of Supplier Documentation, Revision 1

Attachment

PTIP 11203-7.9, Receipt Inspection During Nine Mile Point Project, Revision 1

PTIP 11203-13.1, Materials Storage at NMP, Revision 0

PTIP 11203-19.1, Environmental Control Program for NMP, Revision 0

Drawings of HSM Components

Design Drawing:

TN Drawing 11203-6300, HSM Configuration, Sheets 1 and 2, Revision 0

TN Drawing 11203-6301, ISFSI Layout – 30 Modules of HSM 102 – 10 Modules (Single Array)  
2x10 Modules (Double Array), Revision 0

TN Drawing NUH-03-6301, General Arrangement, Sheets 1 through 5, Revision 2

TN Drawing NUH-03-6302, Main Assembly, Sheets 1 through 5, Revision 1

TN Drawing NUH-03-6303, Base, Sheets 1 through 5, Revision 1

TN Drawing NUH-03-6304, Roof, Sheets 1 and 2, Revision 0

TN Drawing NUH-03-6305, Walls, Sheets 1 and 2, Revision 2

TN Drawing NUH-03-6306, Model 102 Door, Sheets 1 through 3, Revision 1

TN Drawing NUH-03-6307, DSC Support Structure, Sheets 1 through 3, Revision 4

TN Drawing NUH-03-6309, Embedments, Sheets 1 through 3, Revision 3

TN Drawing NUH-03-6310, Heat Shields, Revision 0

TN Drawing NUH-03-6310, Heat Shields, Revision 0

TN Drawing NUH-03-6311, Erection Hardware, Revision 0

TN Drawing NUH-03-6312, Fasteners, Revision 2

Fabrication Drawings

Whitacre Engineering Company Drawing, Contract 2010228, Sheet 100, HSM Model 102 BWR  
End Walls, Revision 8

Whitacre Engineering Company Drawing, Contract 2010228, Sheet 200, HSM Model 102 BWR  
Rear Wall Type 2A, Revision 11

Whitacre Engineering Company Drawing, Contract 2010228, Sheet 201, HSM Model 102 BWR  
Rear Wall Type 2B, Revision 10

Whitacre Engineering Company Drawing, Contract 2010228, Sheet 202, HSM Model 102 BWR  
Rear Wall Type 2C, Revision 11

Whitacre Engineering Company Drawing, Contract 2010228, Sheet 300, HSM Model 102 BWR  
Door, Revision 6

Whitacre Engineering Company Drawing, Contract 2010228, Sheet 400, HSM Model 102 BWR

Whitacre Engineering Company Drawing, Contract 2010228, Sheet 401, HSM Model 102 BWR Base Walls – Elevation #1, Revision 4  
Whitacre Engineering Company Drawing, Contract 2010228, Sheet 402, HSM Model 102 BWR Base Walls – Elevation #2, Revision 6  
Whitacre Engineering Company Drawing, Contract 2010228, Sheet 402A, HSM Model 102 BWR Base – Front Wall Embedments, Revision 3  
Whitacre Engineering Company Drawing, Contract 2010228, Sheet 403, HSM Model 102 BWR Base Walls – Elevation #3, Revision 7  
Whitacre Engineering Company Drawing, Contract 2010228, Sheet 404, HSM Model 102 BWR Roof, Revision 6  
NAES Power Contractors Fabrication Drawing 11203-200, Fabrication Drawing – HSM Model 102 BWR Door, Revision 1  
NAES Power Contractors Fabrication Drawing 11203-400, Fabrication Drawing – HSM Model 102 BWR Base, Sheets 1 through 3, Revision 1  
NAES Power Contractors Fabrication Drawing 11203-400, Fabrication Drawing – HSM Model 102 BWR Roof, Revision 1

QA oversight documents

Constellation Energy Nuclear Group Fleet Administrative Procedure CNG-CA-1.01-1000, Corrective Action Program, Revision 00401  
Constellation Energy Nuclear Group Fleet Administrative Procedure CNG-CA-1.01-1007, Performance Improvement Program Trending and Analysis, Revision 00300  
Q&PA Assessment Report 11-008, Nine Mile Point ISFSI Horizontal Storage Module Fabrication, dated February 7, 2011  
Q&PA Assessment Report 11-020, Nine Mile Point ISFSI Horizontal Storage Module Fabrication, dated April 8, 2011  
TN Specification NUH-03-0217, Field Erection of NUHOMS HSM Array, Section 7, Quality Assurance Requirements, Revision 1  
NMPNS Vendor Procedure E-31034, Nine Mile Point ISFSI Project QA Interface Procedure, Revision 0  
HSM Model 120 Base Procedure Sign-Off Sheet for Base ID# NMP-B-IS-01, Lift #1  
HSM Model 120 Base Procedure Sign-Off Sheet for Base ID# NMP-B-ES-01, Lift #1  
AREVA/Transnuclear NCR No. 2010-193, Hairpin is rotated ninety degrees from Design Location Due to Interference with Through-Wall Penetration  
AREVA/Transnuclear NCR No. 2010-219, Delivered Concrete Did Not Meet Slump or Unit Weight Requirements  
AREVA/Transnuclear NCR No. 2011-090, Gradation of Fine Aggregate Did Not Conform to ASTM C33 Requirements  
AREVA/Transnuclear NCR No. 2011-093, Gradation of Fine Aggregate Did Not Conform to ASTM C33 Requirements  
AREVA/Transnuclear NCR No. 2011-094, Admixture out of Tolerance  
AREVA/Transnuclear NCR No. 2011-102, Gradation of Fine Aggregate Did Not Conform to ASTM C33 Requirements  
AREVA/Transnuclear NCR No. 2011-104, Base NMP-B-IS-01 Was Spalled During Core Form Removal Resulting in Rebar Exposure  
AREVA/Transnuclear NCR No. 2011-116, Base NMP-B-IS-02 Was Spalled During Core Form Removal Resulting in Rebar Exposure

AREVA/Transnuclear NCR No. 2011-137, Rebar Discrepancy Between Design Drawing and Placement Drawing

Atlantic Testing Laboratories

Concrete compressive strength test results of concrete used in the fabrication of HSM components, Report No. ST3109C-09B-05-11, dated May 19, 2011, for Base ID# NMP-B-IS-01, Lift #1

Concrete compressive strength test results of concrete used in the fabrication of HSM components, Report No. ST3109C-15B-06-11, dated June 3, 2011, for Base ID# NMP-B-ES-01, Lift #1

ASTM C31/ 31M-09, Standard Practice for Making and Curing Concrete Test Specimens in the Field

Personnel Qualifications of workers performing the fabrication and construction activities

Concrete Batch Plant (Northern Ready Mix, Inc.) Certifications per National Ready Mixed Concrete Association (NRMCA) QC Manual, Section 3, Plant Certification

NRMCA Certificate of Conformance for Concrete Production Facilities, dated March 18, 2011 (expiration date: March 18, 2012)

Inspection Record of Delivery Fleet: internal condition; chutes/hoppers clean; mixer capacity, mixing speed, revolutions counter, water gauge or meter accuracy

Scale Calibration Certificates, dated October 6, 2010 (due date: October 31, 2011)

Other Documents Reviewed

Work Order C907999049, ISFSI Project HSM Fabrication and Installation

Certificate of Compliance for Spent Fuel Storage Casks, Certificate 1004, Docket 72-1004, Amendment 10

Attachment A, Technical/Quality Requirements, NUHOMS Horizontal Storage Modules (HSM), HSM Model 102 for storage of DSC-61BT and HSM Model H for storage of DSC-61BTH.

Transnuclear, Inc., Final Safety Analysis Report for Standardized NUHOMS Horizontal Modular Storage System for Irradiated Nuclear Fuel.

**LIST OF ACRONYMS**

AC	alternating current
ACI	American Concrete Institute
ADAMS	Agencywide Documents Access and Management System
ALARA	as low as is reasonably achievable
ASTM	American Society for Testing Materials
CAP	corrective action program
CFR	Code of Federal Regulations
CoC	certificate of compliance
CR	condition report
DRMS	Digital Radiation Monitoring System
DSC	dry shielded canister
ECP	engineering change package
EDG	emergency diesel generator
ED	electronic dosimeter
EOP	emergency operating procedure
EPRI	Electric Power Research Institute
EPU	extended power uprate
°F	degrees Fahrenheit
FWP	feedwater pump
GPM	gallons per minute
HP	health physics
HRA	high radiation area
HSM	horizontal storage module
IMC	Inspection Manual Chapter
LDE	lens dose equivalent
LER	licensee event report
LPRM	Local Power Range Monitoring
MAPLHGR	maximum average planar linear heat-generation rate
Mrads	millirads
Mrem	millirem
MS	Mitigating Systems
NEI	Nuclear Energy Institute
NIOSH/MSHA	National Institute for Occupational Safety and Health/Mine Safety and Health Administration
NMPNS	Nine Mile Point Nuclear Station, LLC
NRC	Nuclear Regulatory Commission
NSTS	National Source Tracking System
NUHOMS	nuclear horizontal modular system
NVLAP	National Voluntary Laboratory Accreditation Program
OE	operating experience
PARS	Publicly Available Records
PI	performance indicator
PMT	post-maintenance test
QA	quality assurance
QAP	quality assurance program

QC	quality control
qtr	quarter
RB	reactor building
R/hr	roentgen/hour
RCIC	reactor core isolation cooling
RFO	refueling outage
RWP	radiation work permit
SAR	Safety Analysis Report
SCBA	self-contained breathing apparatus
SDE	skin dose equivalent
SDP	significance determination process
SER	Safety Evaluation Report
SRV	safety relief valve
SSC	structure, system, and component
ST	surveillance test
TEDE	total effective dose equivalent
TN	Transnuclear, Inc.
TS	technical specification
UE	Unusual Event
UFSAR	updated final safety analysis report
VHRA	very high radiation area
WO	work order